

**REMARKS**

Claims 1 to 31 are pending. No claims have been canceled. No claims have been withdrawn from consideration. No claims are amended. No claims have been added.

**§ 103 Rejections**

Claims 1 to 31 stand rejected under 35 USC § 103(a) as being unpatentable over U.S. 5,773,534 (Antonelli et al.) in view of U.S. 6,007,833 (Chudzik et al.), U.S. 5,362,826 (Berge et al.), U.S. 4,394,493 (Bartkovitz et al.) and U.S. 5,653,699 (Reed et al.). The rejection is traversed.

Applicants have previously argued that the Antonelli et al. reference neither teaches nor describes:

- 1) “pendent hydrophilic poly(alkylene oxide) groups”,
- 2) “pendent free-radically polymerizable functional groups”,
- 3) “poly(alkylene oxide) crosslinking agent having polymerizable, ethylenically unsaturated terminal groups”, or
- 4) “hydrophilic” oligomers.

In the Office Action dated 4/6/2006, the Examiner acknowledges that the reference does not teach “hydrophilic, polymer pendent polyalkylene oxide groups and free radically polymerizable functional groups”. That is, the Examiner appears to admit the reference fails to teach or suggest Applicant’s limitations of 1) “pendent hydrophilic poly(alkylene oxide) groups”, and 2) “pendent free-radically polymerizable functional groups”. The Office action appears to admit that the reference also fails to teach or suggest Applicant’s limitation of 4) “hydrophilic” oligomers or, but fails to address the limitation of “”, 3) “poly(alkylene oxide) crosslinking agent having polymerizable, ethylenically unsaturated terminal groups”.

To correct the deficiencies of the primary reference, the Office Action refers first to U.S. 6,007,833 (Chudzik et al.), which describes “a crosslinkable macromer system that includes two or more polymer-pendant polymerizable groups and one or more photoinitiator groups. The polymerizable groups and the initiator group(s) can be pendant on the same or different polymeric backbones”. With reference to column 4, lines 15-20, the Office Action notes “the

polymeric backbone is preferably selected from the groups consisting of synthetic macromers such as polyvinylpyrrolidone (PVP), polyethylene oxide (LPEO), polyethylene glycol (PEG)..."

Applicants submit that the reference does not teach or suggest an oligomer having pendent poly(alkylene oxide) groups. Applicants use the adjective "pendent" in the conventional sense; i.e. hanging down, dangling, or suspended from the backbone of the oligomer. The text relied upon refers to the backbone of the reference macromer, not groups pendent therefrom. The Examiner is request to review Applicants description of the monomer used to provide pendent poly(alkylene oxide) groups at page 8, lines 7 to 15. The Examiner may note the instant monomer contains only one polymerizable group "Z", in contrast to the "two or more polymerizable groups" of the reference macromer.

Applicants will stipulate that the Chudzik macromer may read on Applicant's "poly(alkylene oxide) crosslinking agent" (Component b)), but does not read on Applicant's oligomer.

In this instance, the Examiner is taking the reference terms "polyethylene oxide (LPEO) and polyethylene glycol (PEG)" entirely out of context. What the reference might teach is a macromer having, for instance, a polyethylene glycol backbone having pendent polymerizable groups and (optionally) pendent photoinitiator groups, although the reference provides no teaching as to providing a polymer backbone of the structure  $-(CH_2CH_2O)_x-$  with pendent groups. Such a macromer is distinct from the oligomer of instant claim 1, which is an oligomer having a carbon-carbon backbone, with the recited groups pendent from the carbon-carbon backbone. Each of the monomers used in preparing Applicant's oligomer is an ethylenically unsaturated monomer having the recited groups (for example, an ethylenically unsaturated monomer having a poly(alkylene oxide) group), such that the oligomer has a carbon-carbon backbone.

In making the rejection, the Examiner has failed to provide the missing claim limitations by relying on Chudzik et al. The Office Action compounds the error by then making a purported substitution without providing any rationale for doing so. Specifically, the Office Action fails to provide motivation for providing a hydrophilic monomer in the polymer composition of Antonelli et al. There is no teaching or suggesting of rendering the polymers of Antonelli et al. hydrophilic, and such a substitution would appear to defeat the purpose of the reference: to

provide coatings for automotive application. The Examiner is invited to review Antonelli et al. at column 10, lines 14 to 25.

As previously argued, claim 1 may further be distinguished from the reference by the limitation that the first component oligomer comprise "pendent free-radically polymerizable functional groups", which are described from the monomers described from page 9, line 19 to page 10, line 25. At reference column 3, lines 2-14, it is taught that "[a]t least a portion of the comonomers carry reactive functional groups which can serve as crosslinking sites". The subsequent definition of "reactive functional groups" are those that would react by a displacement or condensation reaction, such as carboxylic acid, amide, esters, epoxy, hydroxy, isocyanate, amino, anhydride, silyl, cyano, and the like. Thus, the reference compositions crosslink by a fundamentally different mechanism (displacement or condensation) than do the instant compositions.

The Office Action again attempts to cure the defect of Antonelli et al. by relying on Chudzik et al, which teaches a crosslinkable macromer system that includes two or more polymer-pendant polymerizable groups. However, the Office Action provides no rationale for replacing the functional groups of Antonelli et al, which reacted by a displacement or condensation reaction, with the polymerizable groups of Chudzik et al., which react by a free radical mechanism. Note that free radical crosslinking is not taught or suggested by Antonelli et al. To make the suggested substitution ignores an essential feature of Antonelli et al; the crosslinking by a displacement or condensation mechanism. The purported substitution is contrary to the rules of M.P.E.P 2143.01 which states "[i]f the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious".

Next, the Examiner refers to U.S. 5,362,826 (Berge et al.) to correct the deficiencies of the primary reference. As previously argued, the reference macromonomers appear to be the same used in the polymerization process of Antonelli et al. and therefore suffers from the same defects; Berge et al. neither teaches nor describes "pendent hydrophilic poly(alkylene oxide) groups", "pendent free-radically polymerizable functional groups", the "poly(alkylene oxide)

crosslinking agent having polymerizable, ethylenically unsaturated terminal groups”, or “hydrophilic” polymers.

The instant Office Action fails to address the deficiencies of Berge et al., and provides not rational for making the substitutions and/or modifications required to meet the limitations of instant claim 1. Unlike Antonelli, the Office Action does note that Berge et al. is useful “...in coatings (particularly high performance coatings such as automotive finishes and industrial maintenance coatings), inks, adhesives, and sealants, and basically whatever one skilled in the art would use a low molecular weight , low dispersity polymeric material.”.

While the Office Action recognizes the utility of Berge et al., and presumably the utility of Antonelli et al., the instant rejection fails to note that there is no teaching or suggestion of rendering the compositions of either reference hydrophilic, as required by the instant claims. Particularly, the Office Action must recognize the recited end-uses are not enhanced by rendering, for example, an automotive finish hydrophilic. Applicants again assert that M.P.E.P. 2143.01 requires that proposed modifications cannot render the prior art unsatisfactory for its intended purpose. In this instance, rendering the composition of either Antonelli et al. or Berge et al. hydrophilic would render the compositions unsatisfactory for the recited uses.

The Office Action next refers to U.S. 4,394,493 (Bartkovitz et al.) which describes crosslinkable graft copolymers of N-methylol acrylamide derivates and poly(oxyalkylene) compounds. The resulting polymers are described as poly(oxyalkylene) chains having N-methylol acrylamide derivatives, grafted thereon, presumably through hydrogen abstraction on the poly(oxyalkylene), followed by radical addition to the acrylamide.

Bartkovitz et al. does not correct the deficiencies of Antonelli et al. As previously argued, the following deficiencies of Antonelli et al. are noted:

- 1) “pendent hydrophilic poly(alkylene oxide) groups”,
- 2) “pendent free-radically polymerizable functional groups”,
- 3) “poly(alkylene oxide) crosslinking agent having polymerizable, ethylenically unsaturated terminal groups”, and
- 4) “hydrophilic” oligomers.

Of these, Bartkovitz does indeed provide hydrophilic polymers and/or oligomers and required be the 4<sup>th</sup> listed deficiency, but as a very different composition that either instant claim 1

or Antonelli et al. As with Chudzík, the Office Action has provided not rationale for rendering the compositions of Antonelli et al hydrophilic. As such, there is no motivation for making the modifications suggested in the Office Action.

Further, Bartkovitz et al. fails to provide the necessary limitation of “pendent free-radically polymerizable functional groups”, as such groups are neither taught nor suggested by the reference. The only source of unsaturated groups is the N-methylol acrylamide derivatives, which are used to graft to the poly(oxyalkylene), and the grafting process does not yield pendent unsaturated groups, nor pendent poly(alkylene oxide) groups.

Bartkovitz et al. also fails to provide the necessary limitation of “poly(alkylene oxide) crosslinking agent having polymerizable, ethylenically unsaturated terminal groups”. The only apparent mechanism for crosslinking of the polymers of Bartkovitz et al. is a displacement reaction. Thus, the suggested combination of Bartkovitz with Antonelli yields a crosslinkable composition that crosslinks by displacement.

The Office Action fails to identify specifically how Bartkovitz et al. is used to correct the deficiencies of Antonelli et al. Applicants have previously argued that claim 1 may be distinguished from Bartkovitz et al. in the limitations of “pendent free-radically polymerizable functional groups” and a hydrophilic poly(alkylene oxide) crosslinking agent having polymerizable, ethylenically unsaturated terminal groups. Therefore, Bartkovitz et al. cannot be relied upon to provide the necessary modifications of Antonelli. Were such limitations taught by Bartkovitz, the Office Action further fails to provide any motivation for making the modifications.

The Office Action next turns to U.S. 5,653,699 (Reed et al.) to cure the deficiencies of Antonelli et al. However, the relevance of Reed et al. is not apparent as it cures none of the deficiencies. At best, Reed et al. provides a listing known hydrophilic materials, and may be relevant to claim 29, but the Office Action makes no such distinction.

As previously argued, the Office Action does not offer a *prima facie* case of obviousness. M.P.E.P. requires the Examiner to examine the scope and content of the prior art, then ascertain the differences between the prior art and the claims at issue. The Examiner has failed to recognize the differences between the recited art and the claims, and then failed to provide references to correct the defects in the prior art, and then failed to provide the motivation to

correct these same defects. Then the Office Action makes the conclusory statement that the recited art “as combined teach all the limitations of the instant claims”.

Referring to the instant Office Action, it is asserted that:

“it have been obvious...to use the composition of Antonelli et al since Chudzik et al. and Bartovitz et al. disclose crosslinkable copolymers of poly(oxyethylene), crosslinkable pendent polymerizable groups and polyethylene oxide (PEO) composition useful in preparing gel materials and medical articles...”

First, the Office Action fails to consider each deficiency of Antonelli et al. Chudzik and Bartkovitz may “disclose crosslinkable copolymers of poly(oxyethylene)”, but Applicant’s claims require, and Antonelli lacks each of the four limitations argued supra.

Chudzik et al fails to provide an oligomer having pendent poly(alkylene oxide) groups, as it is the backbone of Chudzik that comprise a poly(alkylene oxide) group. Instant claim 1, and Antonelli et al each describe a polymer or oligomer having a carbon-carbon backbone. With respect to Bartkovitz, the context of the poly(alkylene oxide) group is again referring to the backbone of the polymer, which is subsequently modified with N-methylol acrylamide compounds. Neither teach Applicant’s oligomer, and neither teach pendent poly(alkylene oxide) groups. With respect to Chudzik and Bartkovitz, the Examiner is ignoring the context of the term poly(alkylene oxide) group, and applying it to Antonelli without any rationale, and without any regard to the rules of M.P.E.P. 2143.01.

Bartkovitz does not disclose “crosslinkable pendent polymerizable groups” as asserted, rather groups that may crosslink by displacement or condensation mechanisms. Chudzik does indeed disclose such groups, but fails to correct other deficiencies of Antonelli et al, specifically the pendent poly(alkylene oxide) groups.

Next the Office Action fails to provide proper motivation for combining the references. The Office Action states:

One of ordinary skill in the art would be motivated to combine the compositions taught by Antonelli et al., Chudzik et al., Bartkovitz and Reed to prepared crosslinkable copolymers of

poly(oxyethylene), crosslinkable pendent polymerizable polyethylene oxide (PEO) composition useful in preparing gel materials and medical articles with a reasonable expectation of success”.

The recited text from the Office Action, provides no motivation, merely concludes that one skilled in the art would be motivated to combine the references. M.P.E.P. 2143 and 2143.01 requires that the Office Action provide some motivation, not merely make a conclusory statement. Applicant's again assert that there is no motivation to combine the references, as Antonelli et al is directed to a coating composition used, for example in automotive finishes, and the secondary references are nominally hydrophilic compositions. Applicants specifically request that the Examiner provide some rationale for rendering the compositions of Antonelli et al hydrophilic. Absent such reasoning, the rejection should be withdrawn.

In the instant Office Action, the Examiner correctly notes that Applicants argues that none of the recited references, alone or in combination, teach all the limitations of claim 1. The Examiner then deems Applicant's previous arguments non-persuasive “because Applicants did not argue the fact that the cited references disclose or suggest the components of the claimed compositions”. Applicants disagree with the Examiners conclusions, and the disregard for Applicant's previous arguments.

Since the previous Office Action did not follow the procedures for establishing a prime facie case for obviousness under M.P.E.P. 2142 and 2143, it was incumbent on Applicant's Agent to do so. Applicant's response recited the missing elements of Antonelli et al., and then noted that each secondary reference failed to provide the missing elements. Further, Applicants argued that the Examiner failed to provide motivation or any rationale for modifying Antonelli et al. to provide the missing claim elements. Applicant's further provided arguments against combining the references, or making the requisite modifications. To combine disparate claim elements from different references, without context, and without providing motivation, is not the standard for a rejection under 35 USC § 103(a).

The rejection of claims 1 to 31 under 35 USC § 103(a) as being unpatentable over U.S. 5,773,534 (Antonelli et al.) in view of U.S. 6,007,833 (Chudzik et al.), U.S. 5,362,826 (Berge et al.), U.S. 4,394,493 (Bartkovitz et al.) and U.S. 5,653,699 (Reed et al.) has been overcome and

should be withdrawn. Claims 2-31 each add additional features to claim 1. Claim 1 is patentable for the reasons given above. Thus, claims 2-31 are likewise be patentable.

In view of the above, it is submitted that the application is in condition for allowance. Reconsideration of the application is requested. Allowance of claims 1-31 at an early date is solicited.

Respectfully submitted,

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